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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|--------------------------------|------------------|
| 10/054,687 | 01/22/2002 | Thaddeus J. Gabara | Gabara 81-10-1-14 | 5163 |
| 22186 | 7590 | 05/17/2006 | | |
| MENDELSON AND ASSOCIATES, P.C. 1500 JOHN F. KENNEDY BLVD., SUITE 405 PHILADELPHIA, PA 19102 | | | | |
| | | | EXAMINER AGHDAM, FRESHTEH N | |
| | | | ART UNIT 2611 | PAPER NUMBER |

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/054,687

Applicant(s)

GABARA ET AL.

Examiner

Freshteh N. Aghdam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 6 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments, see page 2, filed 2/27/2006, with respect to the rejection(s) of claim(s) 1-17 under Stephen et al, and further in view of the instant application's disclosed prior art have been fully considered and the second argument is persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Stephen et al, and further in view of Hayashi (US 5,600,664).

Applicant's Arguments: On page 2, applicant argues that Stephen does not teach a merged trellis "wherein the merged trellis provides combined probabilities of transition from one or more states at $k-N$... to current states at time k ..." On the same page, applicant argues that Stephen and the instant application's disclosed prior art neither alone or in combination teach "the merged trellis provides combined probabilities of transition from one or more states at $k-N$, N is an integer greater than 1, to current states at time k ."

Examiner's Response: With regards to the first argument, Stephen teaches a merged trellis wherein the merged trellis provides combined probabilities of transition from one or more states at $k-N$... to current states at time k (Fig. 18; Par. 223). With regards to the second argument, examiner found the second argument persuasive.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 16-17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Applicant claims a machine-readable medium, wherein the medium can be a transmission medium. On par. 45, applicant claims a machine readable medium "transmitted over some transmission medium such as over electrical wiring or cabling, through fiber optics, or via electromagnetic radiation, ..."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7-13, and 15-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Stephen et al (US 2002/0029362), and further in view of Hayashi (US 5,600,664).

As to claims 1, 7, 9, and 16, Stephen teaches a maximum a posteriori (MAP) processor for data comprising: retrieving a first block of samples and a corresponding set of forward probabilities, wherein the block of samples correspond to states of a

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merged trellis, wherein the merged trellis provides combined probabilities of transition from one or more states at $k-1$ to current states at time k as the set of forward probabilities; and updating the set of forward probabilities of the merged trellis for the current state at time k based on the block of samples and the corresponding set of forward probabilities (Fig. 18; Par. 71-77, 190, and 223). Stephen is silent about the trellis diagram provides combined probabilities of transition from one or more states at $k-N$, N is an integer greater than 1, to current states at time k as the set of forward probabilities. Hayashi teaches the trellis diagram provides combined probabilities of transition from one or more states at $k-N$, N is an integer greater than 1, to current states at time k as the set of forward probabilities (Fig. 10; Col. 2, Lines 64-67; Col. 3, Lines 1-17). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of the Hayashi with Stephen in order to reduce the amount of calculation and memory required in the decoding process.

As to claims 2, 10, and 17, Stephen teaches retrieving a second block of samples and a corresponding set of backward probabilities, wherein the samples correspond to states of the merged trellis, wherein the merged trellis provides cumulative probabilities of transition from one or more states at time $k+1$ to current states at time k as the set of backward probabilities; and updating the set of backward probabilities of the merged trellis for the current state at time k based on the block of samples and the corresponding set of backward probabilities, wherein the computation of the backward probabilities are similar to the forward probabilities (Par. 71-77 and 190). Stephen is silent about the trellis provides combined probabilities of transition from

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one or more states at $k+N$, N is an integer greater than 1, to current states at time k as the set of forward probabilities. Hayashi teaches that the trellis diagram provides combined probabilities of transition from one or more states at $k-N$, N is an integer greater than 1, to current states at time k as the set of forward probabilities (Fig. 10; Col. 2, Lines 64-67; Col. 3, Lines 1-17). One of ordinary skill in the art would clearly recognize that it is obvious to obtain the backward probabilities the same way as the forward probabilities. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Hayashi with Stephen in order to reduce the amount of calculation and memory required in the decoding process.

As to claims 3 and 11, Stephen teaches computing log likelihood values from the updated forward and backward probabilities and generating a data sequence for one or more blocks of samples corresponding to the log likelihood values (Par. 44 and 190).

As to claims 4 and 12, Stephen teaches storing in or reading from a memory each block of sample values for each updating (Par. 90, 164, 165, and 190).

As to claims 5 and 13, Stephen teaches updating the forward probability for a state comprises selecting the maximum combined probability for transitions to the current state (Par. 71-77 and 190).

As to claims 8 and 15, Stephen and Hayashi teach all the subject matters claimed above, except for the MAP processor to be implemented by a processor in an integrated circuit. One of ordinary skill in the art would clearly recognize that employing an integrated circuit, as a processor is well known in the art. Therefore, it would have

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been obvious to one of ordinary skill in the art to employ an integrated circuit as a processor in order to reduce the hardware usage in the system and save space.

Allowable Subject Matter

Claims 6 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Griep et al (US 5,768,285) see figure 2A; Haldik et al (US 6,192,501); Viterbi et al (US 5,933,462); Sadjadpour (US 6,226,773); and Rhee et al (US 6,807,238).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam
May 8, 2006


KEVIN BURD
PRIMARY EXAMINER